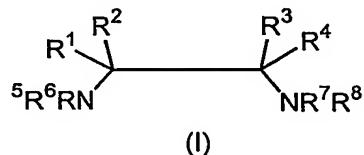


Claims.

1. An immobilised nitrogen-containing ligand comprising the reaction product of a compound of formula (I)

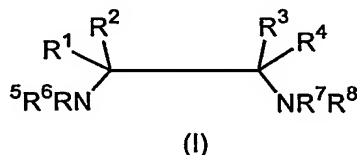


wherein R^5 , R^6 , R^7 and R^8 are independently hydrogen, a saturated or unsaturated C1-C10 alkyl group, an aryl group, a urethane group, a sulphonyl group or form an imine group, R^1 , R^2 , R^3 and R^4 are independently hydrogen, a saturated or unsaturated C1-C10 alkyl group or an aryl group and at least one of R^1 , R^2 , R^3 and R^4 is functionalised with a functional group, and a solid support having a site capable of reacting with said functional group.

2. A ligand according to claim 1 wherein R^1 and R^3 are hydrogen and at least one of R^2 , and R^4 is a functional group-containing aryl group.
3. A ligand according to claim 1 or claim 2 wherein at least one of R^5 , R^6 , R^7 and R^8 is hydrogen.
4. A ligand according to claim 1 or claim 2 wherein NR^5R^6 and NR^7R^8 form imine ($N=C$) groups whereby R^6 and R^8 are omitted.
5. A ligand according to any one of claims 1 to 4 wherein the functional group that may be used to bond to the support is selected from halogen (Cl, Br, F or I), hydroxyl, alkoxy, carbonyl, carboxyl, anhydride, carbene, methacryl, epoxide, vinyl, nitrile, mercapto, amine, imine, amide and imide.
6. A ligand according to any one of claims 1 to 5 wherein the ligand is reacted with a linker molecule that provides a suitable functional group capable of reaction with the solid support.
7. A ligand according to claim 6 wherein the linker is a polyethylene glycol.
8. A ligand according to any one of claims 1 to 7 wherein solid support material to which the nitrogen-containing ligand is covalently bonded is a polymer, metal oxide or organofunctional silica material that has sites capable of reacting with said ligand, said

sites selected from halide (Cl, Br, F, or I), hydroxyl, carbonyl, carboxyl, anhydride, carbene, methacryl, epoxide, vinyl, nitrile, mercapto, isocyanate, amine, imine, amide and imide.

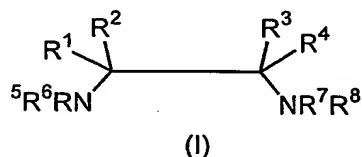
9. A ligand according to claim 8 wherein the solid support is silica, titania, zirconia, alumina or mixtures of these having reactive sites provided by organic compounds comprising carboxylic acids, anhydrides, phosphates, or sulphonates, or metal-organic compounds comprising organic titanates, aluminates, zirconates or organofunctional silanes.
10. A ligand according to claim 8 wherein the solid support is a reactive site-containing polystyrene or polystyrene copolymer.
11. A ligand according to claim 8 wherein the solid support is an organofunctional silica material prepared by the co-hydrolysis of an organofunctional silane and an alkyl silicate and optionally other metal alkoxides.
12. A linker-modified nitrogen-containing ligand of formula (I)



wherein R^5 , R^6 , R^7 and R^8 are independently hydrogen, a saturated or unsaturated C1-C10 alkyl group, an aryl group, a urethane group, a sulphonyl group or form an imine group, R^1 , R^2 , R^3 and R^4 are independently hydrogen, a saturated or unsaturated C1-C10 alkyl group or an aryl group and at least one of R^1 , R^2 , R^3 and R^4 is a aryl group substitutes with a linking compound selected from C1-C10 alkyl, alkoxy, alkyl-aryl, aryl, phenoxy or anilide compounds containing functional groups selected from halide, hydroxyl, carbonyl, carboxyl, anhydride, carbene, methacryl, epoxide, vinyl, nitrile, mercapto, isocyanate, amine, imine, amide and imide.

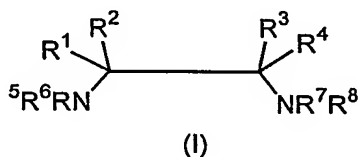
13. A ligand according to claim 12 wherein R^1 , R^3 , R^5 , R^6 , R^7 and R^8 are hydrogen and the linker molecule is a polyethylene glycol.

14. A method for preparing an immobilised ligand of formula (I) wherein R^1 and R^3 are hydrogen, R^2 and R^4 are functional group-containing aryl groups and R^5 , R^6 , R^7 and R^8 are hydrogen,



comprising the steps of ;

- (a) Performing a benzoin condensation on a functionalised benzaldehyde to give a functionalised benzoin,
 - (b) reducing the functionalised benzoin to give a functionalised hydrobenzoin,
 - (c) transforming the functionalised hydrobenzoin into a functionalised 1,2-diaryldiamine, and
 - (d) reacting the functionalised 1,2-diaryldiamine with a solid support having a site capable of reacting with said functionalised 1,2-diaryldiamine to form an immobilised ligand.
15. An immobilised catalyst comprising the reaction product of an immobilised nitrogen-containing ligand of formula (I)



wherein R^5 , R^6 , R^7 and R^8 are independently hydrogen, a saturated or unsaturated C1-C10 alkyl group, an aryl group, a urethane group, a sulphonyl group or form an imine group, R^1 , R^2 , R^3 and R^4 are independently hydrogen, a saturated or unsaturated C1-C10 alkyl group or an aryl group and at least one of R^1 , R^2 , R^3 and R^4 is bound to a solid support, and a metal compound.

16. A catalyst according to claim 15 wherein the metal compound is a compound of Sc, Zr, Hf, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Co, Ni, Pd, Pt, Cu, Ag, Al, Ge, Sb or Sn.
17. A catalyst according to claim 15 or claim 16 wherein the metal compound is a compound of Pd, Pt, or Ru.
18. The use of an immobilised catalyst according to any one of claims 15 to 17 for performing hydrogenation reactions, transfer hydrogenation reactions, dihydroxylation reactions, hydrolysis reactions, carbon-carbon bond formation reactions such as Heck

or Suzuki reactions, hydroamination reactions, epoxidations, aziridinations, cycloadditions, hetero-Diels-Alder reactions, hetero-ene reactions, Claisen rearrangements, carbonyl reductions, sigmatropic rearrangements, additions of nucleophiles to π -bonds, addition of nucleophiles to carbonyl groups and ring-opening reactions.